

Status of GPS/Acoustic Measurements of Seafloor Strain
Accumulation Across the Cascadia Subduction Zone

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This paper presents the status of a long-term experiment using a hybrid GPS/acoustic system to determine strain rates across the Cascadia **a subduction zone**.

In May-June of 1991, long-lived acoustic transponders were installed on the seafloor on both sides of the Cascadia subduction zone. Measurements from a surface buoy, equipped with three GPS antennas and a precision acoustic transducer, located seafloor reference points in the coordinate frame of land-based GPS receivers. These measurements were repeated in September, 1993, and two additional transponders were set in place. Periodic measurements over five to ten years are expected to yield site velocities with sub-cm/year accuracy, sufficient to improve estimates of fault locking depth and net convergence velocity. Current day, determinations of these parameters rely on onshore geodetic measurements and plate motion models. This experimental so serves as an engineering test of the new GPS/acoustic system, and is expected to lead to substantial improvements in experiment design and analysis techniques.

Current evaluations of system accuracy, based on data from the first- and second-epoch measurements, and on comparisons with acoustic surveys, are discussed.